

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname StemUp Model Solution

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

F

Foundation Tier Paper 1 Non-Calculator

Tuesday 19 May 2020

Morning

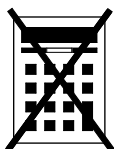
Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- mathematical instruments.

You must **not** use a calculator.



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

For Examiner's Use

Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
TOTAL	

Advice

In all calculations, show clearly how you work out your answer.



J U N 2 0 8 3 0 0 1 F 0 1

Answer **all** questions in the spaces provided.

Do not write
outside the
box

- 1 Here are some numbers.

5	5	8	13	14	15	17
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Circle the range.

[1 mark]

5

11

12

13

- 2 Circle the value of the digit 5 in 256 934

[1 mark]

5000

500 000

50

50 000

- 3 Work out $-2 - 5$
Circle your answer.

[1 mark]

-7

-3

3

7



- 4 What is 680 millimetres in centimetres?
Circle your answer.

[1 mark]

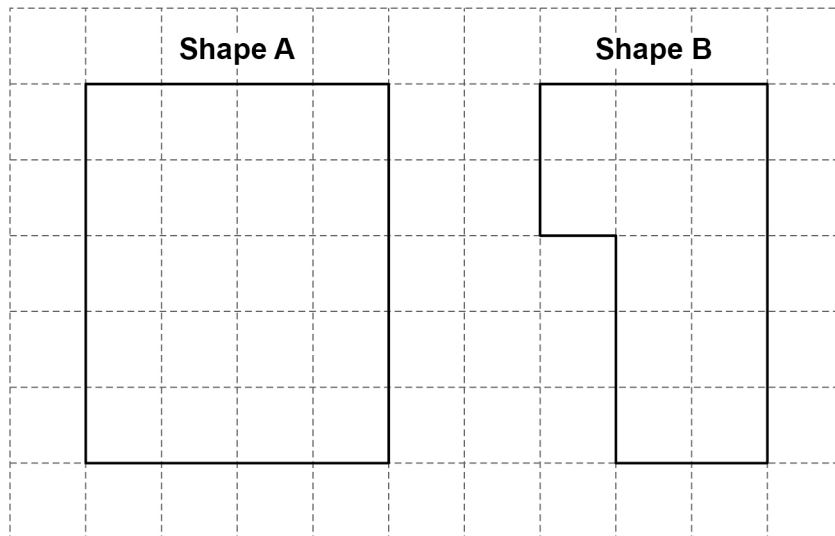
0.68 cm

6.8 cm

68 cm

6800 cm

5



Work out area of Shape A : area of Shape B
Give your answer in its simplest form.

[2 marks]

$$\text{Shape A} = 4 \times 5 = 20 \text{ squares}$$

$$\text{Shape B} = 2 + 5 + 5 = 12 \text{ squares}$$

$$20 : 12 = 5 : 3 \quad (\div 4)$$

Answer 5 : 3

Turn over ►



- 6 (a) Samir and Dan run a race.

Samir finishes in $2\frac{1}{2}$ minutes.

Dan finishes in 130 seconds.

Complete the following sentence.

[2 marks]

Dan wins by 20 seconds.

Samir: 2.5 minutes = 60 + 60 + 30 = 150 seconds

Dan: 130 seconds

150 - 130 = 20 seconds

- 6 (b) Alice does a sponsored walk.

She starts from home on Monday at 8 am

She arrives back home 55 hours later.

Work out when she arrives back home.

[2 marks]

55 hours = 24 + 24 + 7 = 48 + 7

Monday 8 am + 48 hours = Wednesday 8 am

Wednesday 8 am + 7 hours = Wednesday 3 pm

Day Wednesday

Time 3 pm



7

Work out $(43 \times 8) - (234 \div 6)$ **[3 marks]**

$$43 \times 8 = (40 \times 8) + (3 \times 8) = 320 + 24 = 344$$

$$234 \div 6: 6 \times 30 = 180, 234 - 180 = 54$$

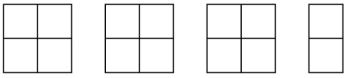
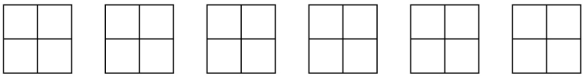
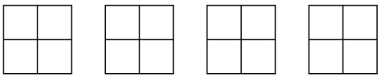
$$54 \div 6 = 9, \text{ so } 234 \div 6 = 30 + 9 = 39$$

$$344 - 39 = 305$$

Answer 305**Turn over for the next question****Turn over ►**

- 8 Here is some information, by ticket type, about the number of people visiting a cinema one week.

Key:  represents 40 people

Adults	
Students	
Children	

- 8 (a) How many children visited the cinema?

[1 mark]

1 square = 40 people, Children = 4 squares

$$4 \times 40 = 160$$

Answer 160

- 8 (b) How many **more** students than adults visited the cinema?

[2 marks]

Students = $6 \times 40 = 240$, Adults = $3.5 \times 40 = 140$

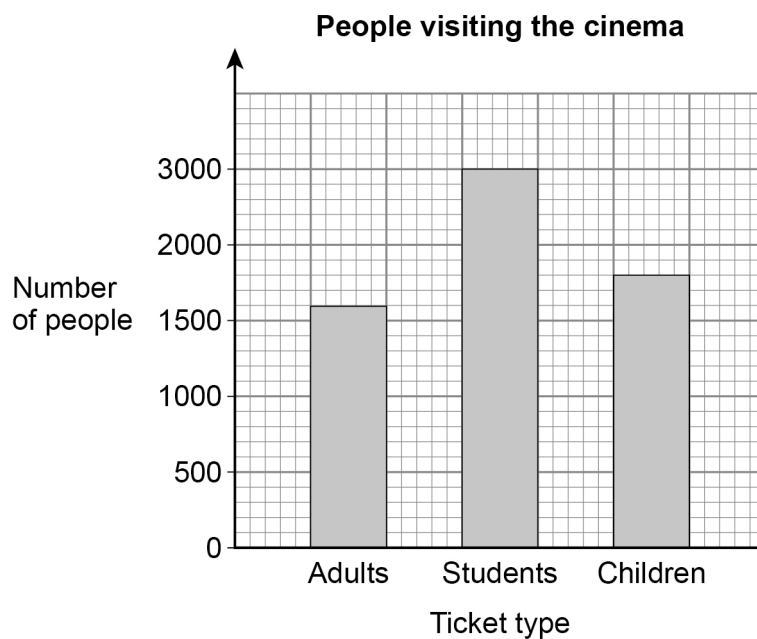
$$240 - 140 = 100$$

Answer 100



- 8 (c) A bar chart is drawn to show the number of people visiting the cinema one month.

Ticket type	Number of people
Adults	1600
Students	3000
Children	1800



Give **one** criticism of the bar chart.

[1 mark]

The vertical scale is wrong: it goes up in 500s but then jumps from 2000 to 3000 (2500 is missing).



9 Harry will pay income tax if he earns more than £12 500 in a year.

After 8 months he has earned a **total** of £7600

For the rest of the year he earns £1200 each month.

Will he pay income tax?

You **must** show your working.

[3 marks]

$$\text{Months left} = 12 - 8 = 4$$

$$\text{Rest of year} = 4 \times 1200 = \text{£}4800$$

$$\text{Total} = 7600 + 4800 = \text{£}12\,400$$

£12 400 is less than £12 500

No, he will not pay income tax.

10 x is a 2-digit whole number.

How many digits does the number $10x$ have?

Circle your answer.

[1 mark]

cannot tell

2

3

4



11 (a) Circle the answer to 50×0.2

[1 mark]

1

10

100

1000

11 (b) Work out $3.65 \div 5$
Give your answer as a decimal.

[2 marks]

$$3.65 \div 5: 5 \times 0.7 = 3.5, 3.65 - 3.5 = 0.15$$

$$0.15 \div 5 = 0.03, \text{ so } 0.7 + 0.03 = 0.73$$

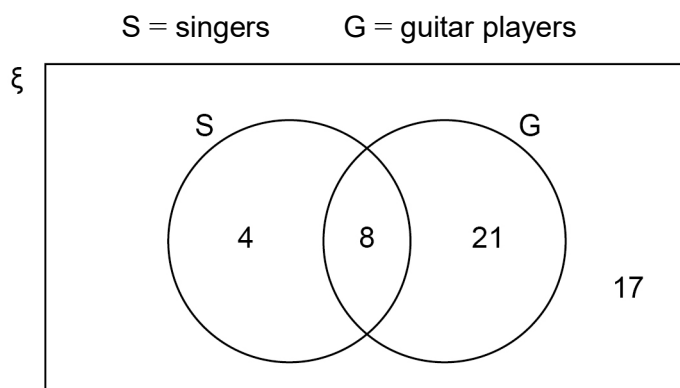
Answer 0.73

Turn over for the next question

Turn over ►



- 12 The Venn diagram shows information about 50 people who are in bands.



- 12 (a) How many of the people are guitar players?

[1 mark]

Answer 29

- 12 (b) How many of the people are singers but **not** guitar players?

[1 mark]

Answer 4

- 12 (c) One of the people is chosen at random.

Write down the probability that the person is

not a singer

and

not a guitar player.

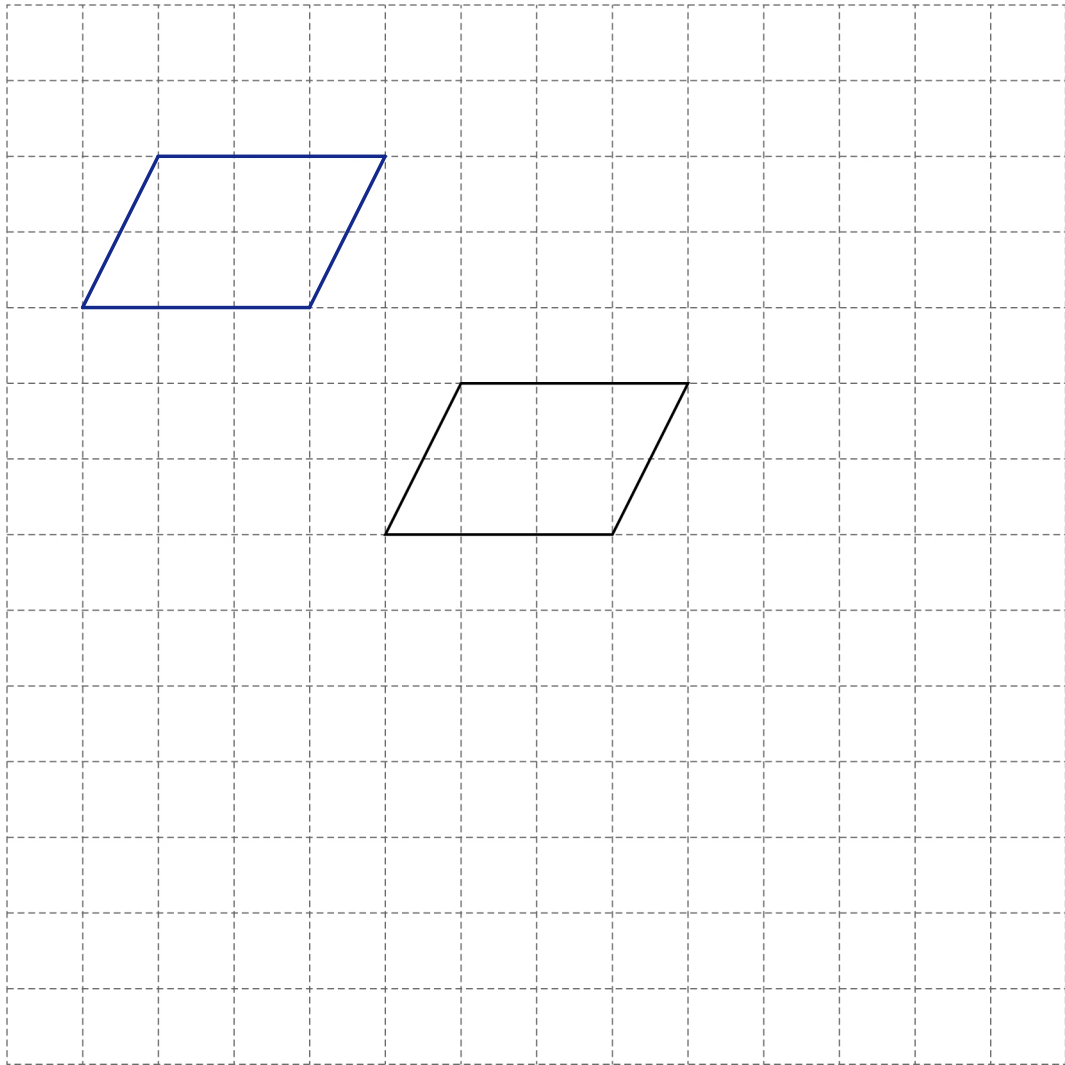
[1 mark]

Answer $\frac{17}{50}$



13

Here is a parallelogram.



The parallelogram is translated 4 squares to the left and 3 squares up.

Draw the translated parallelogram.

[2 marks]

14 (a) Solve $6x - 11 = 13$

[2 marks]

$$6x - 11 = 13$$

$$6x = 13 + 11 = 24$$

$$x = 24 \div 6 = 4$$

$$x = \underline{\hspace{2cm}4\hspace{2cm}}$$

14 (b) Simplify fully $(2 \times 4a) + 9 + \frac{15a}{3} - 7$

[3 marks]

$$2 \times 4a = 8a$$

$$15a \div 3 = 5a$$

$$8a + 9 + 5a - 7 = 13a + 2$$

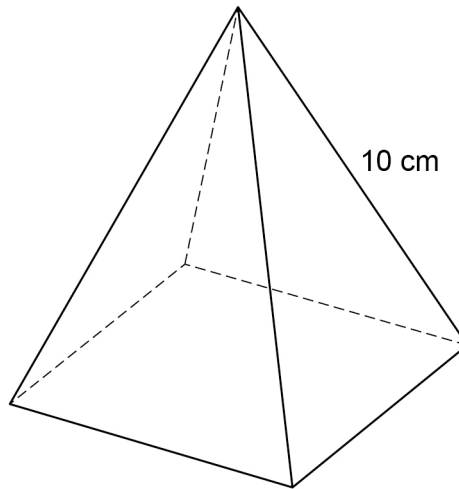
$$\text{Answer } \underline{\hspace{2cm}13a + 2\hspace{2cm}}$$



15

A pyramid has a square base.

Each of the four sloping edges has length 10 cm



The total length of all eight edges is 68 cm

Work out the **area** of the square base.

[4 marks]

$$\text{Sloping edges} = 4 \times 10 = 40 \text{ cm}$$

$$\text{Base edges} = 68 - 40 = 28 \text{ cm}$$

$$\text{One side of base} = 28 \div 4 = 7 \text{ cm}$$

$$\text{Area} = 7 \times 7 = 49 \text{ cm}^2$$

Answer 49 cm²



- 16** The table shows information about how 150 students travel to school.

	Walk	Bus	Car	
Girls	22	33	17	Total = 72
Boys	24	41	13	Total = 78

- 16 (a)** What fraction of the **girls** walk to school?
Give your answer in its simplest form.

[2 marks]

Girls who walk = 22, total girls = 72

$$\frac{22}{72} = \frac{11}{36} \quad (\div 2)$$

Answer $\frac{11}{36}$

- 16 (b)** One of the **boys** is chosen at random.

What is the probability that the boy travels to school by bus?

[1 mark]

Boys by bus = 41, total boys = 78

Answer $\frac{41}{78}$



- 16 (c) What percentage of the 150 **students** travel to school by car?

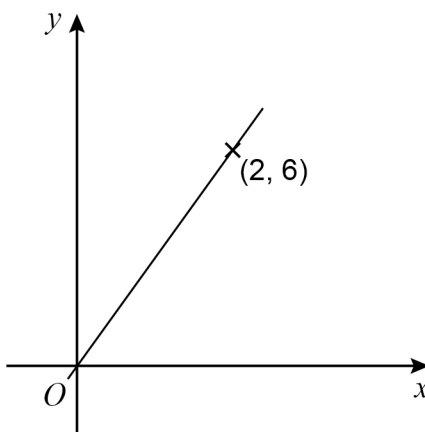
[2 marks]

$$\text{Car} = 17 + 13 = 30 \text{ students}$$

$$\frac{30}{150} \times 100 = \frac{1}{5} \times 100 = 20\%$$

Answer 20 %

- 17 A straight line passes through O and $(2, 6)$



Circle the equation of the line.

[1 mark]

$$y = x + 4$$

$$y = 6$$

$$y = 3x$$

$$y = \frac{1}{3}x$$

Turn over ►



18 (a) Work out 110% of 80

[2 marks]

$$10\% \text{ of } 80 = 80 \div 10 = 8$$

$$110\% = 100\% + 10\% = 80 + 8 = 88$$

Answer 88

18 (b) Work out 21 as a fraction of 12

Circle your answer.

[1 mark]

$$\left(\frac{7}{4} \right)$$

$$\frac{4}{7}$$

$$\frac{3}{4}$$

$$\frac{4}{3}$$



- 19 Bags X and Y each contain counters.

Bag X
30 counters
Each counter is green, white or yellow

Bag Y
5 counters
3 green and 2 red

- 19 (a) $P(\text{green counter from X}) = P(\text{red counter from Y})$

Work out the number of green counters in X.

[2 marks]

$$P(\text{red from Y}) = \frac{2}{5}$$

$$\frac{2}{5} \text{ of } 30 = 30 \div 5 \times 2 = 6 \times 2 = 12$$

Answer 12

- 19 (b) All 35 counters are put into one bag.

One counter is picked at random.

Work out the probability that the counter is **not** red.

[2 marks]

$$\text{Red counters} = 2 \text{ (all in bag Y)}$$

$$\text{Not red} = 35 - 2 = 33$$

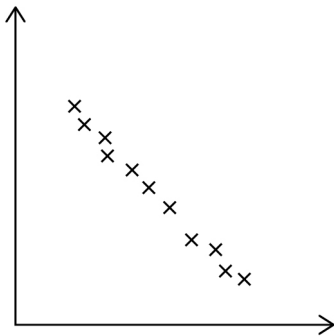
Answer $\frac{33}{35}$



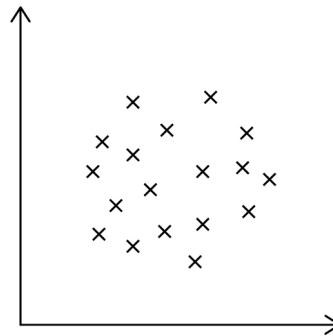
20

A and B are scatter graphs.

Graph A



Graph B



What type of correlation is shown by each graph?

Choose from

Weak positive
Strong positive
Weak negative
Strong negative
No correlation

[2 marks]Graph A Strong negativeGraph B No correlation

- 21 (a) All the terms of a **geometric** progression are positive.
The second and fourth terms are shown.

..... 4 16

Work out the first and third terms.

[2 marks]

$$4 \times r \times r = 16, \text{ so } r^2 = 16 \div 4 = 4, r = 2$$

$$\text{First term} = 4 \div 2 = 2$$

$$\text{Third term} = 4 \times 2 = 8 \quad (8 \times 2 = 16)$$

First term 2

Third term 8

- 21 (b) The first two terms of an **arithmetic** progression are shown.

p $5p$

The sum of the first three terms is 90

Work out the value of p .

[3 marks]

$$\text{Common difference} = 5p - p = 4p$$

$$\text{Third term} = 5p + 4p = 9p$$

$$p + 5p + 9p = 90 \text{ so } 15p = 90$$

$$p = 90 \div 15 = 6$$

Answer 6



22

This formula converts temperature in degrees Fahrenheit (F) to kelvin (K)

$$K = \frac{5}{9}(F - 32) + 273$$

A pottery oven is heated to 2192 degrees Fahrenheit.

Work out this temperature in kelvin.

[3 marks]

$$F - 32 = 2192 - 32 = 2160$$

$$K = \frac{5}{9} \times 2160 + 273$$

$$2160 \div 9 = 240$$

$$240 \times 5 = 1200$$

$$K = 1200 + 273 = 1473$$

Answer 1473 kelvin

23

As a decimal $\frac{11}{40} = 0.275$

Work out $\frac{33}{400}$ as a decimal.

[2 marks]

$$\frac{33}{400} = \frac{11}{40} \times 3 \div 10$$

$$0.275 \times 3 = 0.825$$

$$0.825 \div 10 = 0.0825$$

Answer 0.0825



24

The cost of a holiday is £2400

Rana pays a deposit followed by monthly payments, in the ratio

$$\text{deposit : total of the monthly payments} = 3 : 5$$

She makes 6 equal monthly payments.

Work out her monthly payment.

[4 marks]

$$3 + 5 = 8 \text{ parts}$$

$$1 \text{ part} = 2400 \div 8 = \text{£}300$$

$$\text{Monthly payments total} = 5 \times 300 = \text{£}1500$$

$$\text{Each payment} = 1500 \div 6 = \text{£}250$$

Answer £ 250

25

Factorise fully $2x^2 + 6x$

[2 marks]

$$\text{HCF of } 2x^2 \text{ and } 6x \text{ is } 2x$$

$$2x^2 + 6x = 2x(x + 3)$$

Answer $2x(x + 3)$



26

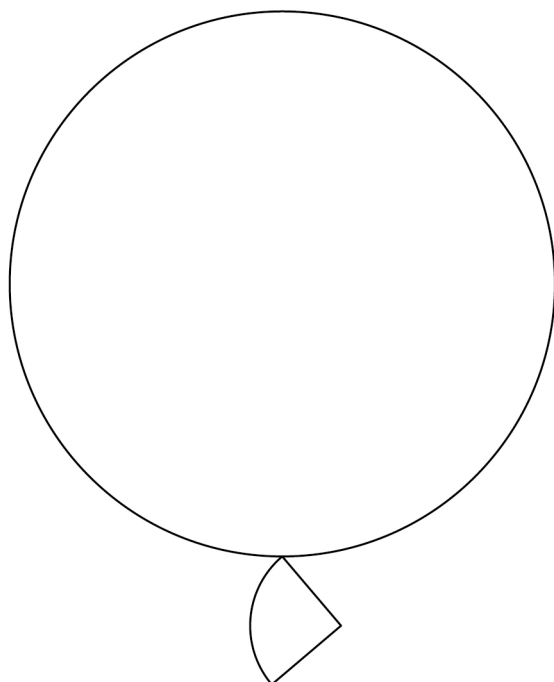
Two wire shapes make an earring.

The shapes are

a circle with radius 21 mm

and

a quarter circle.

Not drawn
accurately

radius of circle : radius of quarter circle = 7 : 2

26 (a) Show that the radius of the quarter circle is 6 mm

[1 mark]

$7 : 2, 21 \div 7 = 3$ so multiply by 3

$2 \times 3 = 6$, so radius of quarter circle = 6 mm



26 (b) Work out the **total** length of the wire in the earring.

Give your answer in the form $a\pi + b$ where a and b are integers.

[4 marks]

$$\text{Circle: } 2 \times \pi \times 21 = 42\pi$$

$$\text{Quarter circle arc: } 2 \times \pi \times 6 \div 4 = 12\pi \div 4 = 3\pi$$

$$\text{Two straight edges: } 2 \times 6 = 12$$

$$\text{Total} = 42\pi + 3\pi + 12 = 45\pi + 12$$

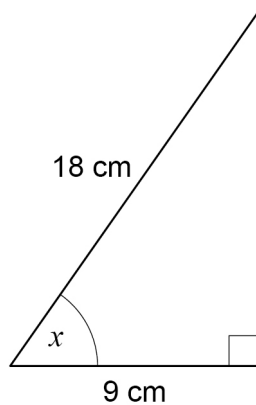
Answer $45\pi + 12$ mm

Turn over for the next question

Turn over ►



27

Use trigonometry to work out the size of angle x .Not drawn
accurately

[2 marks]

$$\cos x = \frac{\text{adj}}{\text{hyp}} = \frac{9}{18} = \frac{1}{2}$$

$$x = \cos^{-1}(0.5)$$

$$x = 60^\circ$$

Answer 60 degrees

- 28 Rearrange $c = \frac{d+2}{3}$ to make d the subject.

[2 marks]

$$\frac{d+2}{3} = c$$

$$d+2 = 3c$$

$$d = 3c - 2$$

Answer $d = 3c - 2$

- 29 (a) Write 360 000 in standard form.

[1 mark]

$$360\,000 = 3.6 \times 100\,000$$

Answer 3.6×10^5

- 29 (b) Write 9.2×10^{-3} as an ordinary number.

[1 mark]

$$9.2 \div 1000 = 0.0092$$

Answer 0.0092

END OF QUESTIONS



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